



CITY OF HOBART

# MINUTES ATTACHMENT

## COMMUNITY, CULTURE AND EVENTS COMMITTEE MEETING

### OPEN PORTION OF THE MEETING

THURSDAY, 5 MAY 2022

AT 5.30 PM

VENUE: COUNCIL CHAMBER, TOWN HALL

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### TABLE OF CONTENTS

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6.1	New Year's Eve Fireworks Display - Presentation by ShowFX	
A.	Allan Spiegel - Deputation Supporting Information .....	2

# Outdoor Fireworks



# Presentation Topics

- Fireworks in the community
- Fireworks vs Other Entertainment i.e. Lasers, Drone shows.
- Economic benefits to the community from Fireworks
- Overview of how fireworks work
- What fireworks are made of
- Fireworks Debris
- Management of Fireworks Debris

# ShowFX Australia Background

- Established in 1995
- The core business of ShowFX is display fireworks, indoor pyrotechnics, confetti, and special effects such as flame and CO2 effects.
- ShowFX only uses genuine products that are trusted worldwide with our skilled expertise.
- Pyrotechnic services all over Australia and around the world
- Awards in Philippines 1st place World Pyro Olympics, 2<sup>nd</sup> place in Omengna Italy



# Facilitator

**Allan Spiegel**  
Creative Director

- Director and founder of ShowFX Australia
- Over 30 yrs. experience in the entertainment industry
- Contributing member of APPA, PIAA, ISES, MEA
- Awards include Telstra 2000 small business award  
ISES Lifetime contribution to events industry award.





# Introduction

This presentation objective is to offer Hobart City Council and Community Culture and Events Committee an opportunity to better understand Firework products and equipment that are being used on displays in Australia on events.

The detailed information is based on current regulations and standards used in Australia. The information is based on best practice with a management process in place to identify risks and hazards from the use of fireworks in the community.

While the session is informative and educational with the aim to ensure a greater understanding of fireworks, this focus is on what is involved in conducting a display. Fireworks should always only be used by professionals who are licenced and experienced in their fields.

At the conclusion of the topics there will be Q & A to ask questions about the Fireworks.

# Legislation

To be able to facilitate a fireworks display the contractors need to be able to satisfy many legislative requirements.

These requirements include State and Federal rules and regulations under the Explosive's Act. Standards which are not limited to building codes, emergency procedures, explosives storage, transport handling.

There is a large risk management process which involves designing of the show and managing all risks associated with the display including documented Risk Assessments, JSA and SWMS (Safe Work Method Statement).

All professional contractors are required to have insurance which requires having all process in place.

# Fireworks- In the Community

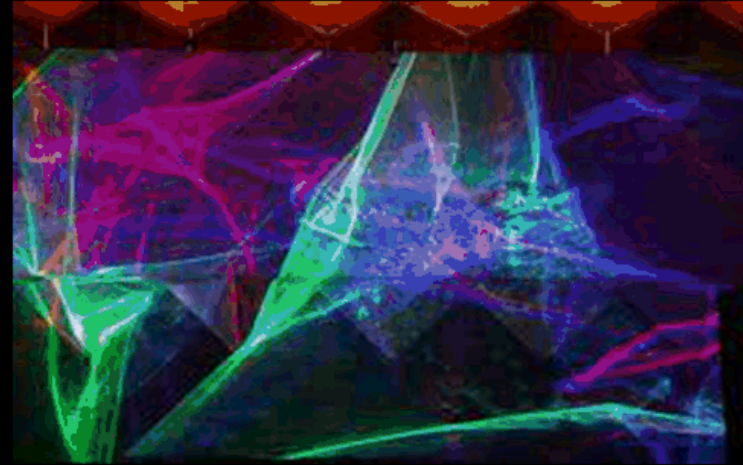
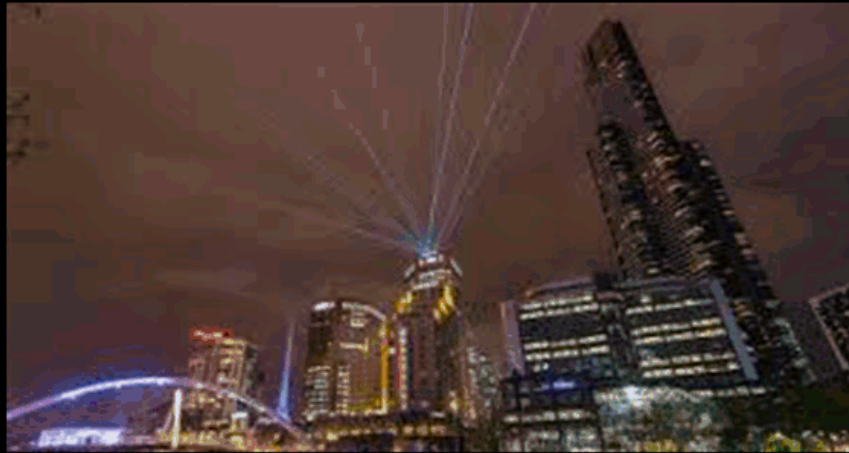
- Fireworks are one of the oldest forms of public entertainment since the 15<sup>th</sup> century. Whilst early fireworks were invented back in the 13<sup>th</sup> century modern day fireworks such as coloured aerial Shell displays were used back in the 1830s
- Fireworks are still the greatest drawcard of crowds for public celebrations.
- Fireworks are still a preferred method of celebration at most events by the vast majority. Offering feelings of hope, happiness and excitement in times of need through the sheer enjoyment and are a part of celebrating life.
- The quality of fireworks has vastly changed over the years with improvements meeting high standards and consistency with environmental factors placing a priority on the way in which they are made and used.
- There are both what is referred to as illegal fireworks and legal professional fireworks.



# Fireworks- VS Drones and Laser Shows

- Other methods of entertainment such as Laser shows and Drone displays are available but are completely different forms of entertainment.
- Whilst they can be considered as alternatives they are very different.
- Both Laser shows and Drone shows have a significantly higher cost vs Fireworks.





Lasers can work well with Fireworks as a combination, but as a stand alone lasers do not share the same visual impact and visual indulgence and can be short when comparing with fireworks.

Laser shows often can only be seen in high humidity and or polluted air and some venues are not appropriate locations for lasers.



- Drones are a very challenging product they require still winds to initiate off the ground and large spaces to launch from all at once.
- There are successful drone shows around the world however the cost is above 1.5mil to put on these sorts of displays.
- Drones don't replace the sheer awe inspiring impact on the audience that fireworks achieve.





# Economic Benefits by Fireworks

- Fireworks are still the best value for money entertainment as a drawcard to any event.
- Fireworks offer huge economic impact on small business i.e. cafes, restaurants, side stalls, hospitality tourism and many other business that directly are able to benefit from the use of Fireworks at these events.
- Fireworks events create jobs.
- For example Sydney NYE costs Syd 10 mil for the event including approx. 1 mil for the fireworks bill but the economic impact is 130 mil based on 2019 figures.
- If you apply the same average which is an average \$130 spent per person across Hobart the estimate that if 50,000 people watched on to the fireworks from somewhere on NYE, the economic impact would be 6.5mil.
- The above people estimation is based on approx. 3-5,000 at the Taste Festival approx. 25,000 around Salamanca and then another 20,000 watching from hotels and apartments and other locations from sandy point to further north.



# Overview of how Fireworks Work

- There are many types of Fireworks which can be broken down into categories such as Aerial Shells, Ground Fireworks, Indoor Pyrotechnics.
- A distinction between consumer fireworks and professional Fireworks is often confusing for unqualified person.
- Consumer Fireworks have been classed by the size and quantity of powder not just type.
- Professional Fireworks are also sized and measured by quantiles however they require trained licensed persons to setup and operate them.
- You can have a type of Firework for example Multishot which is a box like product that shoots multiple shots these can be found in both consumer fireworks and Professional fireworks however the contents will be different both in size and quantity of explosives inside.

The 2 main categories of display fireworks are;

What we class as

- Ground fireworks
- Aerial Shells

Ground fireworks are generally fired from the ground these include

- Mines, comets, multishots, lances, fountains, roman candles, strobes, flares

Aerial Shells are fired from a mortar and reach great heights in the sky

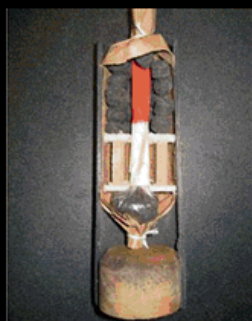


# Mines

Mines generally shot out of a mortar or self-contained mortar.

A mine is a bunch of stars that ignite when they burst out of the mortar. The effect is a large burst effect accompanied with some concussion. They are usually used in sequences and all fire shots to create instant wow factors.

Mines can reach heights between 10m- 50m pending size of mortar and stars



# Comets

A comet is a single bright star that shoots like a shooting star. They mainly burn out but sometimes they have a secondary effect. These are called split comets or crossetts.

Comets are generally shot out of a mortar, but they also come pre-packed with throw away mortar tubes. These are used to create angle patterns in the sky.

They can reach heights of up to 100m- pending size





# Candles

Candles are multiple shooting comets from the one tube. These come in a range of sizes and effects. They do have secondary bursts and noise effects. Candles are used to create patterns in the sky, but also to create quick, large visuals with lots of stars shooting at once

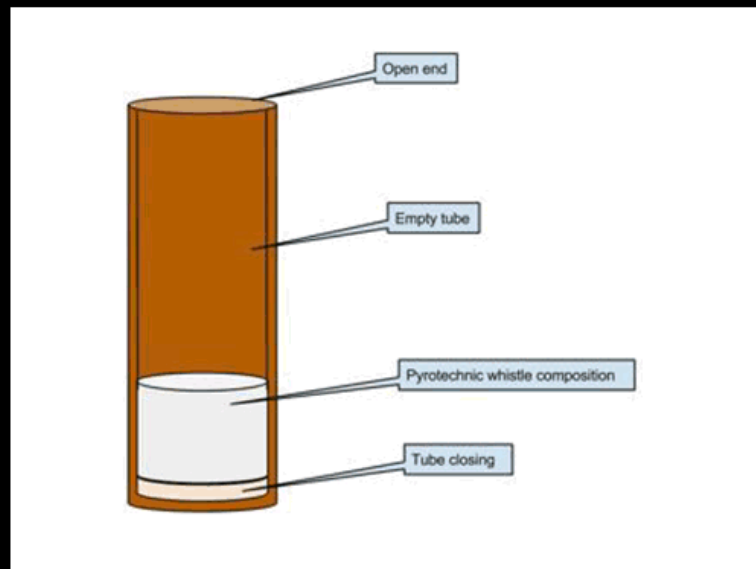




# Strobes/Flares

Strobe/Flares are a theatrical effect. They are used to create flashing light, to begin a show, fill a gap or soft music. They can be installed on sticks or for artistic displays with performers.

Strobes/Flares stay on the ground or are attached to something. They do not shoot up into the sky and generally run for 30-60 sec



# Fountains

Fountains are a plume of sparks that emit bright light. They shoot from the ground and reach heights of up to 8m high. They run for a period of time i.e. 30-60 seconds and are used in sequences. Fountains can be straight up or upside down like a waterfall they also can be angled and depending on size of the fountain.



# Multishots

Multishots are commonly known as box items or cakes. They shoot stars and mini bursting items high into the air but not as high as shells. These items come in a range of sizes and shots.

Each multishot will have a numbers of effects which maybe be the same or different. They run for a period of time. They all have secondary bursting effects .





# Multishots- Continued

Each multishot has a number of tubes bundled together, in a cake like box. Each tube has its own shot in it and the time fuse runs through them to set off at a particular time. They reach various heights from 5m- 100m and have varied times from 1 sec- 200 sec



# Lance Signs

Lances are commonly used to make pictures, signs or logos. They do not shoot up, they are a flare the size of cigarette. They burn at one end and in a formation they display a picture, sign or logo.



SIR ZELMAN COWEN  
CENTRE FOR  
SCIENCE



# Aerial Shells



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# Aerial Shells

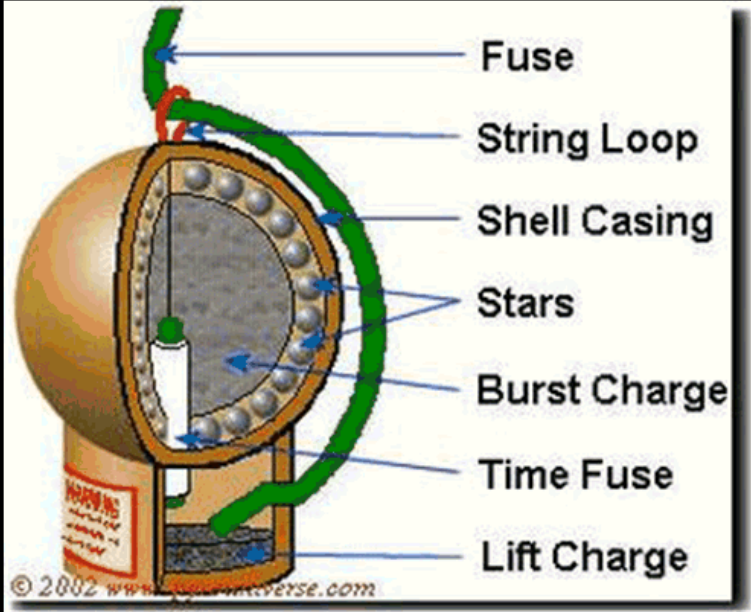
Aerial shells are shot out of mortars and reach heights of up to 300m pending shell and mortar size. The larger the shell the more safety distance you need for the fallout.

Commercially the smallest shell used is 2" but most operators use 2.5" as a starting point. Large shells like 6" and above are generally only used on larger shows such as New Year's Eve or shows where distance is not a problem



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This is a barge with many mortar sizes from 3" to 10" mortar racks. These can be angled if you have enough safety distance.



# Large Shells



Australia



Japan



# What Fireworks look like and are made of



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# Inside the Shells



# Ground Fireworks Equipment

## Strobes

These can be secured by tape or cable tie to a piece of equipment, set or placed in an upright position on the ground. There is very little force in this effect and it does not pose a high risk in securing in any of the methods mentioned.

## Lances

These are usually attached to a cane via glue or tape. The cane is then attached to a frame, then positioned and secured to a post. As lances do not have much force, these don't require any major securing.





# Ground Fireworks Equipment- Continued

## Mines

If they have a self made mortar generally they are placed in a rack to secure the angle and position. If they are requiring a mortar, it needs to be secured to prevent falling over or becoming unsecured. There is a downforce when a mine goes off so any piece of equipment secured to a mine needs to be positioned so the force of the mine does not move the mortar or position. When a mine is placed in a tube it is important to be the correct way up if it is upside down it can blow the mortar out.

## Comets and Candles

Similar to mines, these come with self made mortars or go into a mortar.





# Ground Fireworks Equipment- Continued

## Fountains

Fountains can be attached to a stake with tape or cable ties they need to be secured as they have a little force.

## Multishots

Multishots come in various sizes and shapes and need to be secured for safe use. Some cakes are large and have a big footprint that do not require securing. Cakes can be staked into the ground, placed in a purpose built timber box or used timber between to prevent tipping over. There is force in the cake tubes so it important to understand the product and set it up in a safe manner.



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# Display Management

Risk and planning Management is done through the life of the display

- Initial plans drawings site visits site surveys
- Permitting requirements legislative responsibilities
- Risk Management Assessments
- Safe Work Method Statements
- JSA
- Identification of any potential hazards
- Planning for transport and storage
- Design and Preparation
- Safe Setup of display, execution of display pack up of display
- Debris and waste management of display.

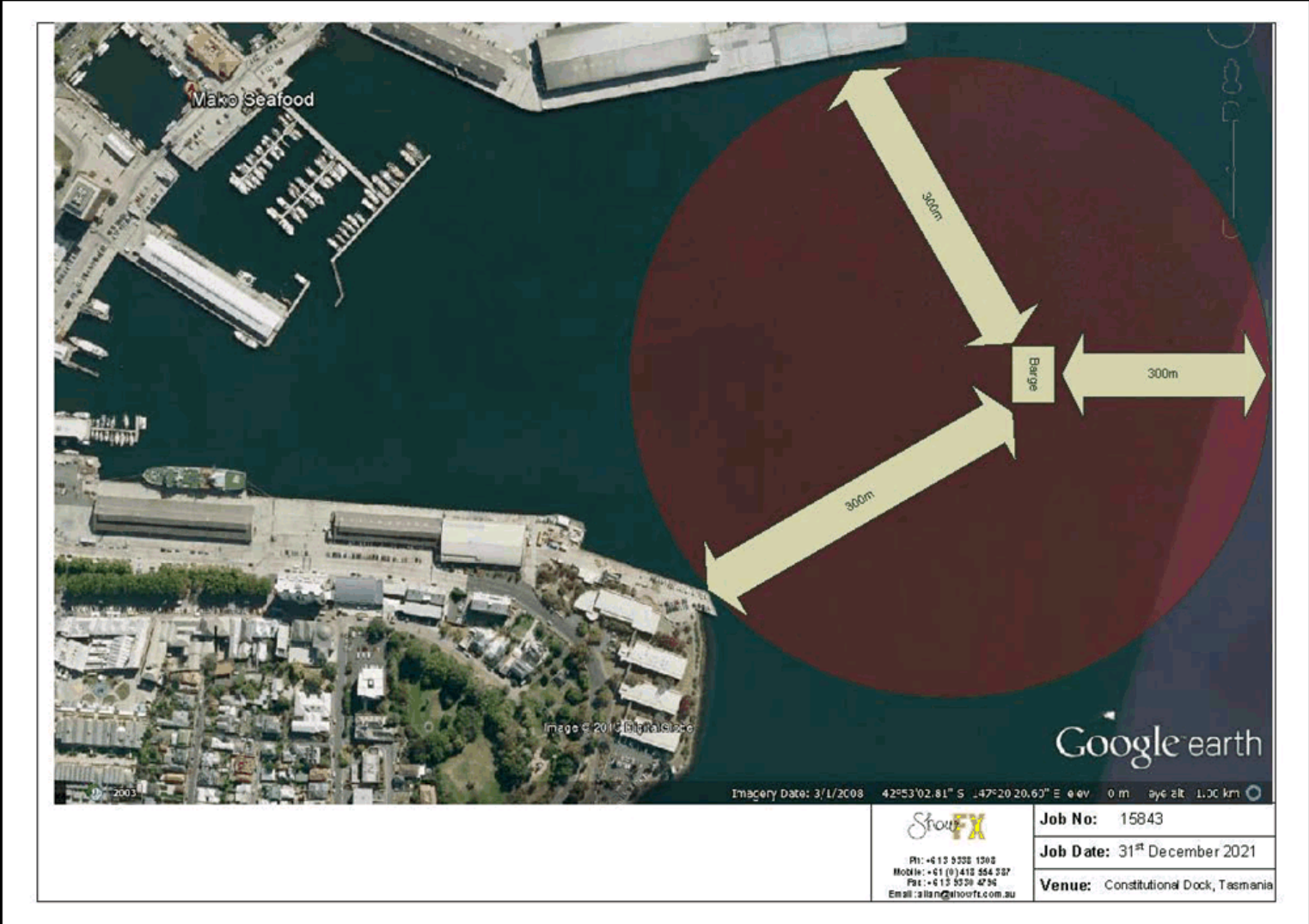


# General Site Notes

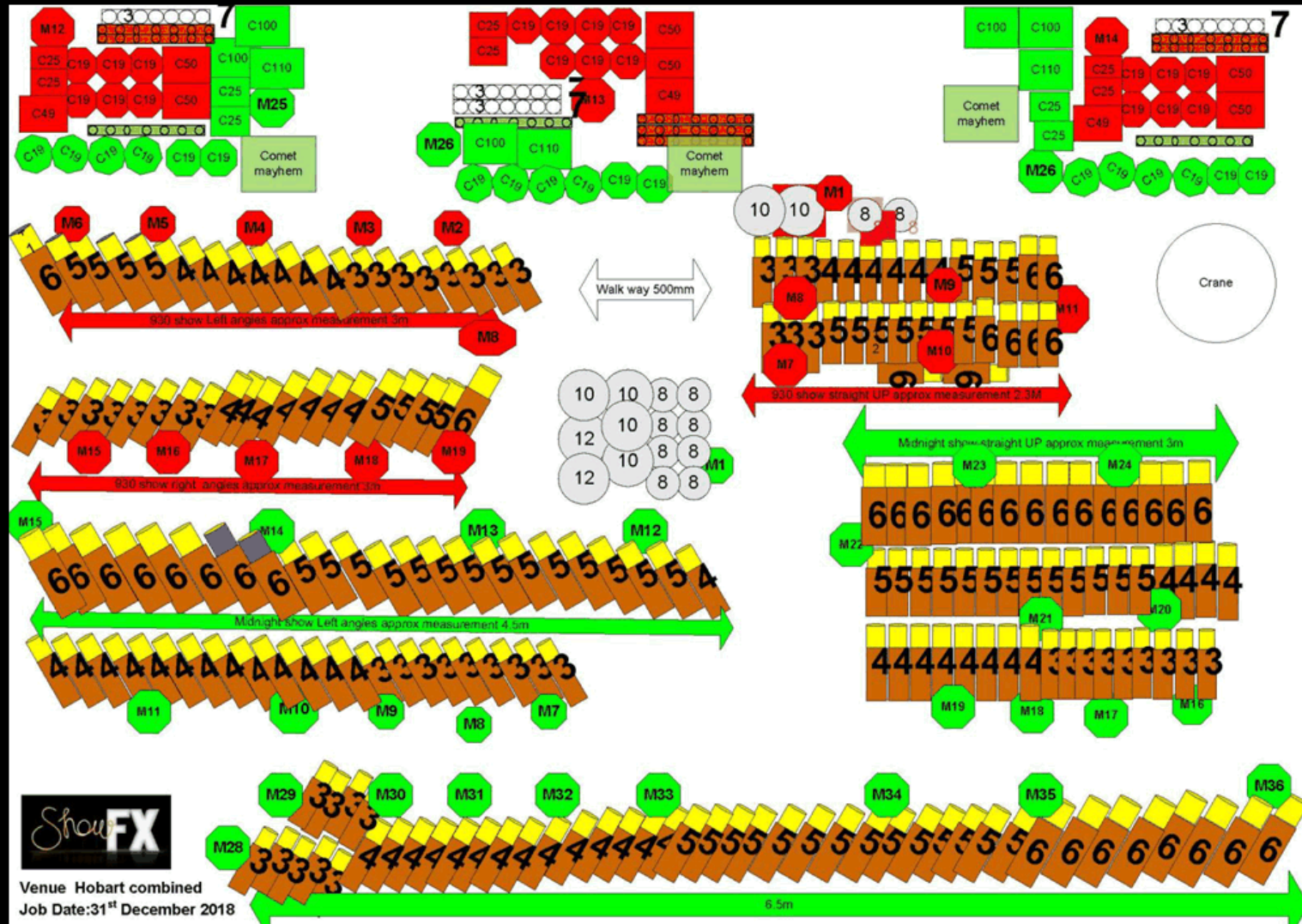
- Security for display/Security breach communication
- Setup exclusion zones
- Show exclusion zones
- Fencing and distances
- Operators clear viewing
- Spotters
- Clean-up
- Variations of sites- sports field, water sites etc.



# Site map on water



# Display layout







# Firework Debris

- Firework Debris comes in a few forms. These days most if not all professional fireworks are made from recycled cardboards, rice papers specifically made Celo tapes and Clay
- Lots of products are made using biodegradable types of Cardboards or paper materials, Clay
- There is recyclable items such as the copper wires and cardboard boxes
- There is reusable items equipment like mortars and timber racks
- There is waste that needs to be discarded i.e. remnants of the shell which would be in paper, cardboard, clay











# Management of Debris

- Management of waste is a living activity in which constant improvements have been made over the past decade to improve management of general fireworks debris waste and make up of the products in which form the fireworks.
- There has been chemical changes and formular changes behind the chemistry and physics of the fireworks.
- There has been the change of plastic shells to a more suitable cardboard shell.
- The way in which we shoot fireworks has also had improvements in terms of reducing waste such as removal of un necessary plastics and papers.
- Reducing fuse lengths is a new current measure we are testing and trailing in order to have less fuse match become debris.



# Environment

- We have a Environmental policy that is a living document that we keep striving for less carbon emissions and better methods that improve Environmental issues caused by fireworks.
- Our best practice methods we employ are
- Conserve energy (produced by non-renewable resources, and by methods which pollute the environment).
- Conserve water resources and minimise wastewater disposal.
- Minimise and where possible, eliminate the use of harmful substances.
- Ensure the correct and safe disposal of all substances.
- Minimise waste generation through reduction, reuse and recycling.
- Minimise pollution - noise, visual, electromagnetic radiation, odour.
- Address environmental concerns in all planning and onsite decisions.
- Encourage procurement procedures that adhere to the principles of the environmental policy.
- Encourage teaching and research activities designed to facilitate and implement specific components of this policy.

# Carbon Emissions

- Based on NYE in Hobart which contains approx. 700KG NEQ (net explosive quantity) the Co2 would be about 340KG to put in context most cars will produce 190G of Co2 in approx. per 1.6km to driving for an average car with a modern engine.
- Based on the above this would equate to 1118Km so lets say average car return trip to the show was 20Km then this would equate to 55 cars coming to see the show.
- We are currently reviewing our carbon emissions payback through our carbon neutral program which we pay towards being carbon neutral.